

Claims:

1. A system for collecting measurements for use by a surface profiling processing scheme, said system comprising:

a movable platform;

an odometer coupled to said movable platform for measuring distance that said movable platform traverses during a measurement run on a surface wherein said measurement run is defined by starting and stopping positions on the surface that are spaced apart from one another;

first means mounted to said movable platform for generating a measurement of inclination of the surface where said movable platform is positioned when said movable platform is stationary thereon;

second means mounted to said movable platform for generating measurements of curvature of the surface as said movable platform traverses the surface;

third means mounted on said movable platform and coupled to said odometer for monitoring said distance that said movable platform traverses during said measurement run and for generating a signal each time said movable platform traverses a predetermined amount of distance during said measurement run, wherein said signal serves as an indication to stop said movable platform during said measurement run; and

fourth means coupled to said first means and said second means for collecting (i) said measurements of curvature while said movable platform traverses the surface during said

26 measurement run, and (ii) said measurement of inclination at
27 said starting position, said stopping position, and each time
28 said movable platform is stopped during said measurement run
29 following the generation of said signal.

1 2. A system as in claim 1 wherein said movable platform
2 comprises:

3 a frame;

4 at least four supports coupled to said frame and
5 contacting the surface wherein said frame is supported above
6 the surface;

7 a first three of said at least four supports being
8 arranged in a linear alignment that defines a direction of
9 travel for said frame, and a remainder of said at least four
10 supports being spaced apart from said linear alignment;

11 said first three defined by a front support, a rear
12 support and a center support centered between said front
13 support and said rear support;

14 said center support being a floating support capable of
15 substantially vertical movement; and

16 at least one of said front support, said rear support and
17 said center support being a wheel configured to roll in said
18 direction of travel.

1 3. A system as in claim 2 wherein said odometer is coupled to
2 one of said front support, said rear support and said center
3 support that is said wheel.

1 4. A system as in claim 2 wherein said first means is an
2 inclinometer mounted on said frame, said inclinometer having
3 an axis of sensitivity that is aligned parallel to said
4 direction of travel.

1 5. A system as in claim 2 wherein said second means is a
2 linear position transducer coupled to said center support for
3 generating said measurements of curvature by measuring said
4 substantially vertical movement of said center support as said
5 movable platform traverses said surface during said
6 measurement run.

1 6. A system as in claim 1 further comprising means to pull
2 said movable platform during said measurement run.

1 7. A system as in claim 1 wherein said signal is realized by
2 at least one of a visual alarm, an audible alarm and a tactile
3 alarm.

1 8. A system as in claim 2 wherein all of said at least four
2 supports are wheels.

1 9. A system as in claim 2 wherein said center support
2 comprises a slidable support that slides on the surface.

1 10. A system as in claim 2 wherein each of said front support
2 and said center support comprises a slidable support that
3 slides on the surface.

1 11. A system as in claim 10 wherein said odometer is coupled
2 to said rear support.

1 12. A system as in claim 1 further comprising fifth means
2 coupled to said fourth means for processing said measurements
3 of curvature and each said measurement of inclination in
4 accordance with a surface profiling scheme to generate surface
5 profile measurements.

1 13. A system as in claim 12 further comprising sixth means
2 for encrypting said surface profile measurements.

1 14. A system for collecting measurements for use by a surface
2 profiling processing scheme, said system comprising:

3 a movable platform;

4 first means mounted to said movable platform for
5 generating a measurement of inclination of a surface where
6 said movable platform is positioned when said movable platform
7 is stationary thereon;

8 second means mounted to said movable platform for
9 generating measurements of curvature of the surface as said
10 movable platform traverses the surface;

11 third means mounted on said movable platform for
12 monitoring distance that said movable platform traverses
13 during a measurement run on the surface wherein said
14 measurement run is defined by starting and stopping positions
15 on the surface that are spaced apart from one another, said
16 third means generating a signal each time said movable
17 platform traverses a predetermined amount of distance during
18 said measurement run wherein said signal serves as an
19 indication to stop said movable platform during said
20 measurement run; and

21 fourth means coupled to said first means and said second
22 means for collecting (i) said measurements of curvature while
23 said movable platform traverses the surface during said
24 measurement run, and (ii) said measurement of inclination at
25 said starting position, said stopping position, and each time
26 said movable platform is stopped during said measurement run

27 following the generation of said signal.

1 15. A system as in claim 14 wherein said movable platform
2 comprises:

3 a frame;

4 at least four supports coupled to said frame and
5 contacting the surface wherein said frame is supported above
6 the surface;

7 a first three of said at least four supports being
8 arranged in a linear alignment that defines a direction of
9 travel for said frame, and a remainder of said at least four
10 supports being spaced apart from said linear alignment;

11 said first three defined by a front support, a rear
12 support and a center support centered between said front
13 support and said rear support;

14 said center support being a floating support capable of
15 substantially vertical movement; and

16 at least one of said front support, said rear support and
17 said center support being a wheel configured to roll in said
18 direction of travel.

1 16. A system as in claim 15 wherein said first means is an
2 inclinometer mounted on said frame, said inclinometer having
3 an axis of sensitivity that is aligned parallel to said
4 direction of travel.

1 17. A system as in claim 15 wherein said second means is a
2 linear position transducer coupled to said center support for
3 generating said measurements of curvature by measuring said
4 substantially vertical movement of said center support as said
5 movable platform traverses said surface during said
6 measurement run.

1 18. A system as in claim 14 further comprising means to pull
2 said movable platform during said measurement run.

1 19. A system as in claim 14 wherein said signal is realized
2 by at least one of a visual alarm, an audible alarm and a
3 tactile alarm.

1 20. A system as in claim 15 wherein all of said at least four
2 supports are wheels.

1 21. A system as in claim 15 wherein said center support
2 comprises a slidable support that slides on the surface.

1 22. A system as in claim 15 wherein each of said front
2 support and said center support comprises a slidable support
3 that slides on the surface.

1 23. A system as in claim 15 further comprising fifth means
2 coupled to said fourth means for processing said measurements
3 of curvature and each said measurement of inclination in
4 accordance with a surface profiling scheme to generate surface
5 profile measurements.

1 24. A system as in claim 23 further comprising sixth means
2 for encrypting said surface profile measurements.

1 25. A system for collecting measurements for use by a surface
2 profiling processing scheme, said system comprising:

3 a movable platform that includes a frame and at least
4 four supports coupled to said frame and contacting a surface
5 wherein said frame is supported above the surface;

6 a first three of said at least four supports being
7 arranged in a linear alignment that defines a direction of
8 travel for said frame, and a remainder of said at least four
9 supports being spaced apart from said linear alignment;

10 said first three defined by a front support, a rear
11 support and a center support centered between said front
12 support and said rear support;

13 said center support being a floating support capable of
14 substantially vertical movement;

15 at least one of said front support, said rear support and
16 said center support being a wheel configured to roll in said
17 direction of travel;

18 an odometer coupled to one of said front support, said
19 rear support and said center support that is said wheel, said
20 odometer measuring distance that said movable platform
21 traverses during a measurement run on the surface wherein said
22 measurement run is defined by starting and stopping positions
23 on the surface that are spaced apart from one another;

24 an inclinometer mounted on said frame, said inclinometer
25 having an axis of sensitivity that is aligned parallel to said
26 direction of travel, said inclinometer generating a

measurement of inclination of the surface where said movable platform is positioned when said movable platform is stationary thereon;

a linear distance sensor coupled to said center support for measuring said substantially vertical movement of said center support as said movable platform traverses said surface during said measurement run, wherein measurements of said substantially vertical movement are indicative of measurements of curvature of the surface;

a distance monitor mounted on said movable platform and coupled to said odometer for monitoring said distance that said movable platform traverses during said measurement run and for generating a signal each time said movable platform traverses a predetermined amount of distance during said measurement run, wherein said signal serves as an indication to stop said movable platform during said measurement run; and

a data collector coupled to said linear distance sensor and said distance monitor for collecting (i) said measurements of said substantially vertical movement while said movable platform traverses the surface during said measurement run, and (ii) said measurement of inclination at said starting position, said stopping position, and each time said movable platform is stopped during said measurement run following the generation of said signal.

1 26. A system as in claim 25 further comprising means to pull
2 said movable platform during said measurement run.

1 27. A system as in claim 25 wherein said distance monitor
2 includes means to output said signal as at least one of a
3 visual alarm, an audible alarm and a tactile alarm.

1 28. A system as in claim 25 wherein all of said at least four
2 supports are wheels.

1 29. A system as in claim 25 wherein said center support
2 comprises a slidable support that slides on the surface.

1 30. A system as in claim 25 wherein each of said front
2 support and said center support comprises a slidable support
3 that slides on the surface.

1 31. A system as in claim 30 wherein said odometer is coupled
2 to said rear support.

1 32. A system as in claim 25 wherein said data collector
2 includes a processor for processing said measurements of
3 curvature and each said measurement of inclination in
4 accordance with a surface profiling scheme to generate surface
5 profile measurements.

1 33. A system as in claim 32 further an encryption generator
2 for encrypting said surface profile measurements.